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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/034,338	12/28/2001	Wayne A. Morgan	047711-0295	8387

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Irvin C. Harrington, III
FOLEY & LARDNER
2029 Century Park East, 35th Floor
Los Angeles, CA 90067-3021

EXAMINER

SUNDARAM, T R

ART UNIT	PAPER NUMBER
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2858

DATE MAILED: 02/10/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.
10/034,338

Applicant(s)
Wayne A. Morgan et al.

Examiner
T. R. Sundaram

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on Dec 28, 2002 is/are a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some* c) ☐ None of:

- ☐ Certified copies of the priority documents have been received.
- ☐ Certified copies of the priority documents have been received in Application No. _____.
- ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

- 14) ☒ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 4

- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed July 31, 2002 has been received and it has been placed of record in the application file.
2. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, the references cited on pages 7 and 8 of the specification must be included in an Information Disclosure Statement.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by *Williams*.

Regarding claim 1, *Williams* discloses an electronic circuit (Fig. 1) for sensing an output of a sensor (10), the electronic circuit comprising at least one electrode pair (54, 56 and 57, Figs.

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5 and 6; and column 6, lines 41 ff) for sensing a parameter (formation factor), the at least one electrode pair (54 and 56) having a first electrode (54) and a second electrode (56), wherein the first electrode wraps at least partially around the second electrode (Fig. 5), and circuitry for processing the parameter (Fig. 1).

Regarding claim 2, *Williams* discloses a first electrode (54) that wraps around the second electrode (56) in a U-shaped fashion (Fig. 5; and column 6, lines 25 ff).

Regarding claim 3, *Williams* discloses an electronic circuit wherein the first electrode (54) wraps around the second electrode (56) by surrounding three sides of the second electrode (Fig. 5).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Williams*, in view of *Kespohl*.

Regarding claim 4, *Williams* does not expressly disclose that the layout of the first electrode and the second electrode minimizes the cross coupling between the first electrode and

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the second electrode.

Making the second electrode in a U-shape is generally practiced in the art for minimizing interferences and cross coupling, as exemplified by *Kespohl*, which teaches that the layout of the first electrode (2 or 4, Figs. 1 and 5) and the second electrode (3 or 4, Figs 2 and 5) minimizes the cross coupling between the first electrode and the second electrode (column 1, lines 68 ff; and column 4, lines 17 ff).

At the time of the invention, it would be obvious to a person of ordinary skill in the art to combine the teaching of *Kespohl* into *Williams* for the purpose of obtaining an accurate signal that is free of interferences.

7. Claims 5-6 and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Williams*, in view of *Schulman et al.*

Regarding claim 5 and 6, which depend on claim 1, *Williams* does not disclose that the electronic circuit comprises a reference electrode for setting a reference voltage for the at least one electrode pair and that the reference voltage is 0.5 volts.

Schulman et al. discloses an electronic circuit (Fig. 6) for sensing the output of at least one electrode pair (Fig. 5, W1 and W2), and that the electronic circuit comprises a reference electrode (REF1 or REF2) for setting a reference voltage for the at least one electrode pair (column 6, lines 40-42; and column 8, line 50) and that the reference voltage is 0.5 volts (column 7, line 17; and column 12, lines 20-21).

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At the time of the invention, it would be obvious to a person of ordinary skill in the art to combine the teaching of *Schulman et al.* into *Williams* for the purpose of setting a known reference voltage against which the voltages measured by the at least one electrode pair can be assessed.

Regarding claims 20-22, which depend on claim 1, *Williams* does not disclose that the parameter sensed by the at least one electrode pair is a physiological parameter and the said physiological parameter is glucose or oxygen.

Schulman et al. discloses an implantable sensor (title; abstract; and; column 1, line 8) that senses glucose (column 2, line 16) and oxygen (column 5, lines 1-2).

At the time of the invention, it would be obvious to a person of ordinary skill in the art to combine the teaching of *Schulman et al.* into *Williams* for the purpose of monitoring a patients blood or other body-fluid characteristics (*Schulman et al.*, column 1, lines 20-22).

8. Claims 7, 8, 10, 13 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Williams*, in view of *Preikschat*.

Regarding claim 7, as discussed above, *Williams* discloses all the limitations in the electronic circuit in claim 1, on which claim 7 depends.

Williams does not disclose that the electronic circuit comprises: a line interface for interfacing with input/output lines, a rectifier in parallel with the line interface, a counter connected to the line interface, and a data converter connected to the counter and the at least one electrode pair.

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Preikschat discloses electrode arrangements (12, E, Fig. 1, column 4, lines 28-34; 100, Fig. 4, column 6, lines 65-66; and 152 and 154, Fig. 7, column 10, lines 1 ff) and associated circuitry (Fig. 1) for measuring the electrical properties of various materials (abstract; column 1, lines 18-23) comprising: a line interface (44, Figs. 1) for interfacing with input/output lines (46, Fig. 1), a rectifier (44, Fig. 1, column 4, lines 44-46) in parallel with the line interface (44, column 4, line 55; and 144, Fig. 6, column 8, line 55 and column 9, line 31), a counter (216 or 210, Fig. 12; and column 16, line 13) connected to the line interface (Fig. 12; through decoders 211 and 212, which receive inputs from the bridge circuits in Fig. 1), and a data converter (56, Fig. 1) connected to the counter (through the decoders 211 and 212, Fig. 12) and the at least one electrode pair (Es in 12, 32, 34, 36 and 38, Fig. 1; column 4, lines 28-34).

At the time of the invention, it would be obvious to a person of ordinary skill in the art to combine the teaching of *Preikschat* into *Williams* for the purpose making accurate measurements of sensed parameters.

Regarding claim 8, as noted above, *Williams* and *Preikschat* disclose all the limitations in claim 7, on which claim 8 depends.

Preikschat also discloses a control logic (Fig. 12; and column 16, lines 2) connected to the counter (Fig. 12, 210 or 216) and the line interface (through decoders 211 and 212 and the bridge circuits).

At the time of the invention, it would be obvious to a person of ordinary skill in the art to combine the teaching of *Preikschat* into *Williams* and incorporate a counter and control logic in

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the circuit, for the purpose of timing and controlling the measurements (*Preikschat*, column 11, lines 60 ff).

Regarding claim 10, *Preikschat* also discloses also discloses that the control logic uses a microprocessor (Fig. 6; and column 8, line 64).

At the time of the invention, it would be obvious to a person of ordinary skill in the art to combine the teaching of *Preikschat* into *Williams* and incorporate a microprocessor in the circuit, for the purpose of automatic control of the sensing and for processing of the data sensed.

Regarding claim 13, *Williams* and *Preikschat* disclose all the limitations in claim 7 on which this claim depends. *Preikschat* also discloses that the data converter is an analog-to-digital converter (56, Figs. 1 and 6)

At the time of the invention, it would be obvious to a person of ordinary skill in the art to combine the teaching of *Preikschat* into *Williams* and incorporate a analog-to-digital converter in the circuit, for the purpose of further processing the data in a digital device such as a microcomputer

Regarding claim 19, as noted above, *Williams* and *Preikschat* disclose all the limitations in claim 7, on which this claim depends. *Preikschat* also discloses using switched capacitor (62 and 86, Fig. 2) circuits as resistors (Fig. 2; and column 5, lines 3-20).

At the time of the invention, it would be obvious to a person of ordinary skill in the art to combine the teaching of *Preikschat* into *Williams* and incorporate switched capacitors as resistors

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in the circuit for the purpose of sensitive control of bridge circuits for measuring small electrode voltages.

9. Claim 9 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Williams*, in view of *Preikschat*., as applied to claims 7 and 8 above, and further in view of *Schulman et al.*

Regarding claim 9, neither *Williams*, nor *Preikschat* discloses that the electronic circuit includes a logic circuit that comprises a state machine and a state decoder connected to the state machine.

Schulman et al. discloses an electronic circuitry (abstract; and Fig. 6) for sensing the output of a sensor (W1, W2, etc., Fig. 5), wherein the control logic (Fig. 6) comprises a state machine (138, Fig. 6; and column 10, line 41) and a state decoder (140, Fig. 6) connected to the state machine.

At the time of the invention, it would be obvious to a person of ordinary skill in the art to combine the teaching of *Schulman et al.* into the circuit of *Williams* and *Preikschat*, and incorporate a state machine and a state decoder, for the purpose of ease of control of the tests by external command signals (*Schulman et al.*, column 10, lines 40-44).

Regarding claim 18, as already noted above, *Williams* and *Preikschat* disclose all the limitations in claim 7 on which this claim depends.

Williams does not disclose a temperature sensor for reading a temperature of the environment and a voltage reference for applying a voltage to the reference electrode. *Preikschat* discloses a temperature sensor (20, Fig. 1) for reading the temperature of the environment

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(column 2, lines 56-58; and column 6, lines 40-43), but does not disclose a voltage reference for applying a voltage to the reference electrode.

Schulman et al. discloses a voltage reference for applying a voltage to the reference electrode (column 12, lines 20-22).

At the time of the invention, it would be obvious to a person of ordinary skill in the art to combine the teaching of *Schulman et al.* into the circuit of *Williams* and *Preikschat* for the purpose of temperature compensation of any reading referenced to the reference voltage.

10. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Williams* and *Preikschat*, as applied to claim 7 above, and further in view of *Jones*.

Williams and *Preikschat* do not disclose that the rectifier transfers power from communication pulses to a capacitor, and wherein the capacitor powers the electronic circuit using power stored from the communication pulses.

Jones discloses a compact power supply (title; and abstract), wherein a rectifier (11, Fig. 1) transfers power from communication pulses (15) to a capacitor (13'), and wherein the capacitor powers the electronic circuit (column 1, lines 14-16) using power stored from the communication pulses (Fig. 1).

At the time of the invention, it would be obvious to a person of ordinary skill in the art to combine the teaching of *Jones* into the circuit of *Williams* and *Preikschat*, for the purpose of supplying electrical power to the circuit.

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11. Claims 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Williams*, in view of *Preikschat.*, as applied to claim 7 above, and further in view of *Gord et al.*

Regarding claims 14-15, which depend on claim 7, neither *Williams*, nor *Preikschat* discloses that the electronic circuit includes a data converter that is an voltage-to-frequency converter or a current-to-frequency converter.

Gord et al. discloses an electronic circuitry (abstract; and Figs. 5A, 5B and 5C) for sensing the output of a sensor (Figs. 1 and 2), wherein the output data is converted to frequency (column 11, lines 28 ff) by a data converter that is an voltage-to frequency converter (column 11, line 31) or a current-to-frequency converter (70, Fig. 5A; and column 11, lines 39-40).

At the time of the invention, it would be obvious to a person of ordinary skill in the art to combine the teaching of *Preikschat* and *Gord et al.* into the circuit of *Williams*, for the purpose of sensing the output data, as a pulse train, with a counter (*Gord et al.*, column 11, lines 48-51).

12. Claims 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Williams*, *Preikschat.* and *Gord et al.*, as applied to claim 15 above, and further in view of *Niezgoda et al.*

Regarding claims 16-17, *Williams*, *Preikschat.* and *Gord et al.* do not discloses that an output of the current-to-frequency converter is scaled using a prescaler before connecting to the counter and that the prescaler is a divide-by-16 prescaler.

Niezgoda et al. discloses a digital tone (frequency) processing circuit (title; and abstract), wherein the input to a counter is scaled using a prescaler before connecting to the counter (Figs.

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1, 2, 5, 9 and 10) and that the prescaler is a divide-by-16 prescaler (Fig. 9; and column 12, line 18).

At the time of the invention, it would be obvious to a person of ordinary skill in the art to combine the teaching of *Preikschat* and *Gord et al.* into the circuit of *Williams*, for the purpose of adjusting the (digital) signals to the capabilities of the counter.

Conclusion

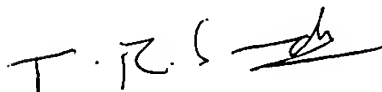
13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Welborn et al. discloses a cardiac resuscitator that includes electrodes in a U-shaped configuration.

Fearnot discloses an implantable sensor for a physiological parameter.

Prutchi et al. discloses sensors and associated circuitry for measuring physiological parameters.

14. Any inquiry concerning this communication should be directed to Dr. T. R. (Joe) Sundaram at telephone number (703) 308-6821. If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, N. Le can be reached at (703) 308-0750.



T. R. Sundaram

January 29, 2003



N. Le
Supervisory Patent Examiner
Technology Center 2800